## STUDIES IN AUSTRALIAN SPIDERS.

By A. P. and R A. Dunn, Melbourne.
This paper deals with three spiders, two of which are new. Probably the most interesting is that well-known species, Celacuia excavata L. Koch, the male of which is recorded for what is believed to be the first time. That this should be so is rot surprising in view of the fact that the male is minute in comparison with the female. Such disparity in size between the sexes dues not seem to be unusual with the Epeiridae, as similar conditions have been recorded in the widely separated genera Argiope Audouin, Arachnura Vinson, Nephila Leach, and Gosteracantha Sundevall.

Belonging to the saine sub-family as Celacnia is Dolophones alfordi, sp. noy. Sixteen species of this genus have been recorded in Australia previously. These spiders are noted for their broad and flattened abdomen, and have a somewhat superficial resemblance to the Gasteracantheae. The abrlomen is not, however, armed with spines, and the labium is longer and more pointed than that of other Epcirids.

With the description of Rebilus swarbrecki, sp. nov., the range of the genus is extended into Victoria. Four species have previously been recorded in Australia, namely: R, bugubris $L$. Koch, from Queensland and New Sonth Wales; R. diversa L. Koch, from Bowen, Nth. Queensland; R. praesignis L. Kowh. from Peak Downs, Queensland; and $R$. castaneus Simon, from Western Australia, The remarkable feature of these spiders is the shape of the median spinnerets, and in this respect Rebihs is closely allied to the Western Australian genus Corimaethes Simon.

The type-specimens, and the allotype of Celocmia entcovota $\mathrm{I}_{\mathrm{s}}$ Koch, are in the collection of one of the authors ( $\mathrm{R}, \mathrm{A}, \mathrm{D}$. ). Acknowledgenents avemadeto Dr. V. V. Hickmant, of Tasmania, and to Messrs. F. G. Elford, L. S. Gr. Butler, and Eyre Swarbreck, of Melbourne, for their help and encouragement.

Order ARANEAE Sub-order DIPNFUMONOMORPHAE.

Branch TRIONYCHAE. Family EPEIRIDAE, Sub-family EIEIRINAE, Genus Gehenia Thorell, 1868. CELAENTA EXCAVATA L. Koch


| Length of Width of Height of | Abdomen Abdomen Abdotnen |  |  | - ${ }^{\prime}$ |  | $\begin{aligned} & 1.51 \\ & 203 \\ & 164 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |
|  |  |  | 1. | -1 | $\bullet$ |  |
|  | Fermur. | Patela, | Tibia. | Mctatarsus. | Tarsus. | Totat, |
| ; .. | 1.72 | 0.71 | 0.98 | 0.50 | 0.36 | 4.27 mm |
| ii .- | 172 | 0.71 | 0.98 | 0.50 | 0.36 | 4.27 mm . |
| iil ${ }^{\text {a }}$ | 093 | 031 | 0.46 | 0.36 | 0.33 | 239 mm . |
| iv . . ., | 1.04 | 031 | 0.61 | 0.49 | 0.30 | 2.75 mm |
| - . . . . | 0.31 | 0.18 | 0.14 | - | 0.36 | 0.99 mm |

Carapace dark brown, with a few white squamose hairs scattered over the surface: marginal band yellowish. Chelicerae, maxillac, labsirm, sternum, and coxae, dark brown. Legs: dark brown; end half of tibiac yellowish; metatarsi yellowist, slightly darker at base, brownish at ajex. Palpi lighter brown Abdomen creamy-ycllow, darker on anterior and posterior slopes; a square pattern of black spinules dear the base; a mixture of smalles black spitules and white squamose hairs scattered sparsely over the suriace. Spinnerets dark brown.

Carapace sounded, surface granular, broadest and highest between legs ii and iii, from where it slopes forward and narrows into a conlical protubetance around whith the median eyes arn grouped. Clypeus concave, equal to approximately 8/9tito of the diameter of A.M.E.

Eyes arranged in two recurved tows as in Figure I. Ratio of eyes AME:ALF:PME:PLE $=27: 18: 20=17$. The AME are separated from each ather ly $40 / 27$, from A.L.E by $14 / 27$, and from P.M.E. By $14 / 27$ of their diameter. The P.ME are seplarated from each other by $23 / 10$, and from P.M.E. by $13 / 10$ of $\mathbf{t h e i r}$ diameter. The 1ateral cyes, plaed on a common tuberele, are separated by $11 / 9$ of the diameter of A.L.E. The median ocular quadrangle is broader than long in the ratio $41=29$, and broader in front than in rear in the ratio $41: 39$.

Cheliccrae conical, granulat, and with few tiaiss. Fang short, Mouth parts and stcrnum also granular, Maxilke oblong parallel, base narrowed. Tabum admost semi-circular, broader, at base, than long in the ratio $6: 5$. Sternmm oval ending in a point between the fourth coxae. Jonger than broad in the ratio $3: 2$.

Legs $1=2,4,3$; sparsely clothed with bristle-like setae, dorsal surface of femorae, patellae, tibiac, and metatarsi, with white suluamose hairs, tarst with black bristles dorsally. Tarsi with serrated bristles and three claws. Superior claws on legs $i$ and ii unequal, the prolateral much the latger, both utarmed. Superior claws on legs iii ant iv equal. Palpal organ as in Figure 2.

Spines - Except for femorae i, it, and tii, and one bristle-spine on ratella iif dorsally near apex, the Jegs are without spines, Femorae $\mathbf{i}$, $\mathbf{i i}$, and iii, have two longitudinal ventral lines of tooth-like spines which vary in size and are less nimerolis on femora iii. Femora iv is unarmed,

Abdomen brosd, tapering to front and rear, 1 mincate in front, elcivated. Spinnerets rosette-shaped, median pair hidden, terminal joints of superior and inferior pairs dome-shaped.

Incality: Carnegie, Victoria. A single mate specimen collected on 4 th February, 1946, from near a female whict had been kept under observation for several monthes. The active movements of the male attracted attention, tut unforturately any mating that may have occurred was not witnessed. The female had a total length of 13.7 mom.

Geti0s Dolopheme's Walckenaer, 1837. DOT,OPHONES ELFORDI, sj, nóv

Female
Total Length
7 mm .
.. 2.63
Length of Cephalothorax .. .. .. .. 3.72
Width of Cephalcthorax .. .. .. .. 455
Length of Abromen .. .. .. .. .. 6.27
Width of Abdomen ... .. .. .. .. 11.59
Mera-

|  |  |  |  | , |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Lete i | 3.47 | 181 | 2.77 | 2.52 | 1.01 | 11.58 mm |
| i) | 3.47 | 181 | 2.77 | 2.64 | 1.01 | 11.70 mm . |
| ii | 2.99 | 1.44 | 169 | 1.63 | 1.05 | 8.81 mm . |
| iv | 4.25 | 199 | 2.44 | 3.54 | 1.20 | 13.42 mm . |
| Palp | 1.27 | 0.69 | 0.74 | - | 1,25 | 3.95 mro. |

Carapace yellowish-hrown, sparsely coverad with light brown and a few dark brown hairs, ases miclosed by patehes of dark brown. Chelicerae yellowish. Maxilice and labium yellowish at base, ercam at apex, Stentum and coxae yellowish-red, provided with a few fite whitich bairs. Leags yellowish; femorae ii, iii, and iv, yellowish-red, [ading to yellowish at apex; metatarsus iv with a black apical ventral patch; tarsi yellowish-red at apex, with a black median ventral patch. Palpi yellowish with darker patches. Abdomen above fawn with greenishgrey markings; ventral surface dark grey, fram cpigastric furrow to base of abdomen white. The colouring of the dorsal surface turths underneath and forms a margin around the ventral surface Spinnerets brown.

Corapace broadest at rear, grafually narrowing in front, Cephatic part low, with a median longitodinal groove extending to the bnse of the ocular tulerele; cephalic striations, moderately distiont. Thoracic part with three longitudinal grooves and two stmalt round depressions Clypeus cqual to approximately $5 / 4$ of the diameter of A.M.E.

Eyes arranged in two fows as in Eigule 3. Anterior row procurved from in fromt, recurved from above. Posterior row procurved. Ratio of eyes AM.E. A.LE. : P.M.E. : PI.E. $=12: 8: 16: 8$. The A.M.E. are separated from each other by $13 / 12$, from AT..F. by $40 / 12$, and from P.M.E. by $17 / 12$ of their diameter. The P,M.E, are separated from each other by 42/16, and from 1?LE, hy 33/16 of their diameter. The lateral eyes, placed on a common tubercle, ate scparated by $1 / 8$ of the diameter of A.L.E. The median eyes are grouped on a low tubercle. the median ocular quadrangle being lirosices than long in the fatio 67 : 40, and broader in rear than in front itt the ratio $67: 37$.

Cheticerae strong, stont, with lateral condyles. Promirgin of furrow with three uneaual teeth, of which the one furthest from the base of the isng is nuch the largest. and the one nearest the base is the smallest, the median tooth being placed in advance of the other two. Retromargin with three tecth, of which the one fitrthest from base of fang is much the largest.

Marillat somewhat oval in shape provided with apical scopulae. Labium bonger than broad in the ratio 7 : 6 , apex puintod.

Stermum subround, longer than liroad in the ratio $71=67$, ending posterlorly in a donible point between the well-sepatated fourth coxae. A medium longitudinal sidge, increasing in height anteriorty, muns from
the middle to the anterion margin. In front of cach coxa is a low tabercle.

Legs 4, 2, 1, 3; provided with stiff, almost spinclike bristles. Patellac, tibiae, and metatarsi, flattened dorsally. Tarsi with serrated bristles and three claws. Superior claws robust, equal, and similar, each provided with about nine recth, of which the modian teeth are a little longer than the basal and the apical. Palpi short, provided with stiff bristles. Patellae and tibae flattencd dorsally, The single tarsal claw has about six long teeth.

Spines on legs and palpi arranged as follows: First log-Femur: dorsal 2 near apex, prolateral $1-1$, elsewbere 0 . Patella : prolateral 1-1-1, retrolateral 1-1-1, clsewhere 0 . Tibia : dorsal 0 , prolateral 1-1-1-1-1, retrolateral 1-1-1-1, venitral 2-2-2-2-2, Metatarsus ; dorsal, 0, prolateral 1-1-1-1-1-2, tetrulateral 2-1-1-2-1, ventral 4-2-2-2-2. Tarsus: 0. Second leg - Femur and patela as in leg i. Tibia : dorsal 0, pro* lateral 1-1-1-1, retrolateral 1-1-1-1, ventral 2-2-2-2. Mctatarsus and tarsus as in leg $i$. Thind leg- Temur : Borsal 2 near apex, prolateral 1 near apex, elsewhere 0. latella prolateral 1-1-1, retrolateral t neat apex, elsewhere 0 . Tibia : darsal 0 , prolateral $1-1-1$, retrolateral 1 , ventral 2-1-1-2. Motatarsus : dorsal 0 , prolateral 1-1-1-2, retrolateral 1-1, ventral 2-2-2-2. Tarsus: 0. Fourth leg-Femur : dorsal 1-1, elscwhere 0. Patella : prolateral i near apex, retrolateral i near'apex, elsewhere 0 . Tibia $=$ dorsal 0 , prolateral 1-1-1-1, retrolateral 1-1-1-1, ventral 2-1-1-2. Metalarsus : dorsal 0, prolateral 1-1-1-1-1-2, retrolateral 1-1-1-1, ventral 2-1-1-1-2. Tarsus : 0. Palp-Femur : 0. Patelis : 0. Tinia : dorsal 0, prolatefal 1-2, detrolateral 1-1, ventral 1 at apex Tarsus ; dorsal $1-2$, prolateral $2-2-2$, retrolateral $1-1$, ventral 0 .

Abdomen somewhat triangular in shape, with the apex of the trisngle to the rear. Dorsal surface slightly convex, pleated ind foldef to the rear, ortamented with a mumber of ocellated patches, four of which form a median trapezium nartowest in front; bight others form a trimsverse row aloug the base, and, from the outermost of these Iatter, two lateral rows rut along each side and merge jnto the foiding towards the rear of the abdomen. Ventral surface slightly concave, cortueated. Epigynum has the form shown in Figure 4 Spinnerels rosette-shaped, triminal joint of inferior pair domeshaped, posterior spinnerets with longet and tapering terminal joint.

Lacolity: Woorage, via Beechwortb, Victoria A single female "found on eucalypta" by a punil (Frances Mclutosii) of State School 653, and furwarded to Mr. F. G. Elford, B.Sc., of the Teachers' College, Melbourne: February 1946.

> Branch DIONYCHAE. Family GNAPHOSIDAE. Sub-family HEMICLOEINAE.
> Genus Rebilts Sithon, 1880. REBILUS SWARARFCKI, sp. nov.

Female
Total Length $\quad . \quad \ldots \quad . \quad . \quad . \quad 20.6$
Length of Cepbalothorax $\quad . . \quad{ }^{-} \quad . \quad 8.5$
Width of Cephalothorax. $\quad .1 \quad \therefore \quad . . \quad \therefore 80$
Length of Alidomen $\quad \therefore \quad . . \quad \therefore \quad . \quad . \quad . \quad 121$
Width of Abdomen $\quad . \quad$.. $\quad . . \quad$.. $\quad$. 7.5

|  | Femur. | Patella | Tilur | Mctatarsus. | Tarsus. | Torat. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Leg ; | 9.1 | 5.0 | 7.1 | 5.4 | 1.9 | 285 mm . |
| ii | 11.0 | 3.6 | 10.2 | 7.3 | 1.4 | 36.0 mm. |
| iii | 8.8 | 3.3 | 6.0 | 4.8 | 1.8 | 24.7 mm , |
| iv | 9.1 | 3.1 | 59 | 4.9 | 1.8 | 24.8 mtr . |
| Patg | 2,4 | 13 | 1.2 | - | 20 | 6.9 mm . |

Caropace and legs brown, clothed with grey hairs interspersed with a few small black bristles. Marginal band and ocular area almost blackChelicerae black Maxillae and labium brown, the former cream towards apex. Sternum and coxae yellow-brown. Abromen greyish, fairly densely covered with grey hairs. Lung-covers creans. Epigynum dark brown.

Ciarapace very flat, posterior margin concave. Dorsai grooves distinct. Thoracic groove longitudinal. Cephalic part also with a short longitudinal groove, Clypens narrow, being equal to approximately $2 / 5$ of the diameter of A.M.E. A few bristles are present before the A.M.E, and near the A.L. E.

Eyes arranged in two rows as in Figute 5. Anterior row shightly procurved. Posterior row recurved, broader than anterior row in the ratio $265: 203$. Ratio of eyes A.M.E : ALE : P.M.E. : P.L.E. $=21: 28$ $: 13: 23$. The A.M.E. are separated from each other by $21 / 21$, froor A.L.E by $43 / 21$, and from P.M.E, by $165 / 210$ of their diameter. The PM.E are scparated from each other by $61 / 13$, and from [1. L. . by $71 / 13$ of their diameter. The lateral eyes, placed on a common protubetance, are separated by $30 / 28$ of the diameter of A.L.E. The median ocular quadrangle is broader than long in the ratio $87 ; 45$, and broader in sear that in front in the ratio $87: 63$.

Chelicerge projecting forwatd, furnislued in front with black bristles Latural condyles present. Promargin of furrow with scopula and threc subegual teeth. Retromargin with two teeth,

Maxillae constricted in middle, slighty converging over labium, with apical scopulae. Labium longer than broad in the ratio $13: 11$. excavated at base, znterior margin troncate and reachiog to about hatf the length of the maxillae, posterior margit convex.

Stermunt somewhat oval in shape, langer than beoad in the ratio $3: 2$ ending in an ohtuse point between the fourth coxae, in front slightly attenuated and truncate.

Legs 2, 1, 4, 3, laterigrade, sparsely clothed with bristle-like setae. Femorac swollen at tase, taperiag to apex. Trichobochtia present on libiac, metatarsi, and tarsi, All tarsi, and metatarsi i and ii, with ventral scopolae. Tarsi with clawntufts and two claws, the claws without teeth. The single paljial claw is also without teeth.

Spines on legs and palpi arranged as follows. First Jeg - Femur : 0 Patcils $=0$. Tibia : ventral 2-1-1-2-2 (on left leg 1-1-1-2-2 only), elsewhere 0. Meratarsus : ventral 2-1, elsewhere 0. Tarsus - 0. Second leg-Feniug : 0. Fatella : 0 . Tibia = ventral $2-1-2-2$, elsewlere 0. Metatarsus $=$ ventral 2-1, elsewhere 0 . Tarsus : 0 . Third and fourth legs without spines. D'ulpi with a few long bristles on tibiae and tarsi, but without spines,

Abdomen very flat, tapering to rear, where it is roundex. Frigymum has the form shown in Figure 6. Inferlor spinnerets ale separater by approximately $5 / 3$ of their diameter. Median spinnerets, as in Figure 7, with longitudinal truncature provided with two rows of spinules.


Celacsia excasata L. Koch (Male):

1. Dorsal view of eyes. (The A.L.E. are not visible from above, but their positions are indicated by broken lines). 2. Prolateral view of right palpus.
Dolophones elfordi sp. nov. (Female):
2. Dorso-anterior view of eyes. 4. Eprigyrum,

Rebilus swarbrecki sp. nov. (Female):
5. Dorsal view of cycs. 6, Epigyuum. 7. Spinncrets.

Locality; Moun Buffalo, Vietoria. A single lemale collected by Mr, Eyre Swarloreck; January, 1946.

## Reftrences.

Koch. L., 1871-1889_ - Die Arachniden Ansiraliens.
Rainhow, W. J., 1907-1909, - Records of the Ausfation Mifsequn (V) 5, p. 33 , and vii. 4. pp. 213-226)

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## FORESTS AND WATER SGPPLY

The intionate relation of forests to water supply is forcefully shown in an illustrated leaflet just issued by the "Save the Forests" Campaign. The writer of the leaffet, Mr. L. R. East, Chairman of the State Rivers and Water Supply Commission, gives some surprising figures regarding the value of primary production made possible ley water conservation work over the past fifty years. The expenditure in the construction of reservoirs and dannels for the irrigation districts for this period has been approximately $415,000,000$. This large sutn, however, is almost equalled in one vear's production from irrigation areas. In the year 1943-44, the palue of primary products in the natural state froms irrigation districts seached a total of f $11,351,000$, while these products in the mabulactured state increased substantially in value.

Mr. East is scathing in fies criticism of those who, through thoughtlessgess or selfishmess, jeopardise the lives of their neighbours and the natural resources of the State.

## WHEN DO SNIPE DEAVE VICTORIA?

In a discussion on this question reently in was agreed that most of the birds have left for Asia by the end of February, but one man, a countrydweller, said that he once saw two jack-smpe on April 3. That was in a stubtule paddock, which trad in places hecome water-logged after: heavy rain. He was Iortunate enough to bag both birds, which were in excellent condition, strong flyers, and about the largest of the species the had seet.

Speaking of the movements of snipe in Mornington L'eminsula, the old-time game-shooter, H. W. Wheclwright, said that the birds left there in February or the beginning of March, while A. J. Camplell mentions March 12 as his latest reonrd for the exodiss. It is worth noting that the eggs in his collection were got towards the end of April on the slopes of Fujiyama, and it is unlikely that the birds, worn out by the long flight from Southern Australia to Japan, would hegin laying immediatcly after their retpin.

## AWARD OF GOLD MEDAL FOR HORTICUJTURE

Congratulations of the Cluls are extended to Mr. Noel Lothisn, a member now resident in New Zealand. At the recent Dominion examination for Natintal Diploma of Herriculture, Mr. Lothian gamed highest marks and earned the coveted Cockayne Gold Medal. His first important contribution on the Wahlenbergia specics ("Olue-bells") of Australasia is very shortly to be published by the Lianean Soriety of N.S.W, and represents years of monographical research into this difficult geous, both here and on the Continent.

